

In-Class Worksheet 1: DFAs and Simple Proofs

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This is the first of a series of ungraded worksheets that are meant to break up the monotony of **two-hour lectures** and give y'all some more practice. Feel free to work on them together.

1 DFAs

Try to write down DFAs for the following languages

- $\{ w \mid w \text{ starts with 3 0s or 3 1s} \}$
- $\{ w \mid w \text{ is matched by the regular expression } 10^*(1|0) \}$ (this is a preview of a connection we'll be making formally later!)

2 An Inductive Proof

Prove, by induction over natural numbers, that every number is either even or odd. This should be a very simple proof, but the goal is to get used to the idea of natural induction.

3 A Proof by Contradiction

Prove, by contradiction, that the negative of an irrational number is irrational

http://www.personal.kent.edu/~rmuhamma/Philosophy/Logic/ProofTheory/proof_by_contradictionExamples.htm